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time. And he added, that in such instances the original or more ancient work was invariably of a higher style of art and better execution than that of such subsequent additions. He also observed that the crucifix which is now so usually found on such reliquaries is always, obviously, an addition of a later date, and is, in all the instances which have come under his attention, in a more barbarous taste than that of the original, or older work, and is besides of an inferior style of execution.

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The Secretary presented, on the part of G. C. Cowell, Esq., Prospect House, Milltown, two volumes of Autograph Manuscripts of Jonathan Swift, D. D., Dean of St. Patrick's, Dublin; one being an account of his daily expenses from May to August, 1735, and a list of his tenants in the Deanery and at Rathbeggan, with the sums payable by them in the year 1734; the other being a collection of thirty-five songs and poems.

The special thanks of the Academy were given to Mr. Cowell for this donation.

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Rev. Samuel Haughton read an account of the late Professor M'Cullagh's Lectures on Attractions, and Clairaut's Theorem, reported by Mr. Allman.

Professor M'Cullagh's Lectures on Attractions were delivered to the Candidates for Fellowship in Trinity College in Hilary and Michaelmas Terms, 1846.

Mr. M'Cullagh's Lectures included the attraction of an ellipsoid on a point situated outside it, the attraction of any body on a distant point, and the application of these problems to the Figure of the Earth and Clairaut's Theorem.

The attraction of an ellipsoid on a point outside may be reduced by means of Ivory's Theorem to the attraction of another ellipsoid on a point inside, and the attraction of an ellipsoid on a point inside is reducible, by means of a well-known

theorem to the attraction of a similar ellipsoid on a point situated on its surface.

The peculiarity of Mr. M'Cullagh's method consisted in the manner in which he discussed this latter problem.

The three following propositions contain the complete solution of the question :—

**PROP. I. THEOREM.**—If  $P$  be any point on the surface of an ellipsoid, and  $PC_1$  be drawn perpendicular to any axis  $OC$  (where  $O$  is the centre and  $C$  the extremity of the axis); the component of the attraction of the given ellipsoid on the point  $P$ , estimated in the direction  $OC$  is equal to the attraction of another ellipsoid similar and similarly placed upon a point situated at its vertex  $C_1$ .

**PROP. II. PROB.**—To calculate the attraction of an ellipsoid on a point placed at the extremity of an axis.

**PROP. III. PROB.**—To find geometrical representations of the attraction of an ellipsoid upon a point situated at the extremity of any axis.

Having completely discussed the question of the attraction of an ellipsoid, Mr. M'Cullagh found the attraction of any body on a distant point by means of the following expressions.

Let  $O$  and  $N$  denote the centre of gravity and the attracted point; and let the ellipsoid of gyration be described, having  $O$  for its centre.

Let a tangent plane to this ellipsoid be drawn perpendicular to  $ON$ , cutting it in the point  $S$ , and touching the ellipsoid in the point  $T$ .

Let  $M$  denote the mass of the attracting body, and  $\gamma'$  the distance  $ON$ , then—

The attracting force lies in the plane of  $OST$ , and if  $R$  and  $P$  denote the components of attraction in and perpendicular to the direction of the line joining the centre of gravity of the attracting body with the attracted point.

$$R = \frac{M}{\gamma^2} + \frac{3}{2\gamma^4} \{A + B + C - 3I\}$$

$$P = \frac{3M}{\gamma^4} \{OS \times ST\}$$

$A, B, C$ , being the principal moments of inertia of the body, and  $I$  the moment of inertia with respect to the axis  $ON$ .

The proof of Clairaut's Theorem from the foregoing equations formed the concluding part of Mr. Allman's communication.

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Rev. Samuel Haughton read a paper on a Modification of Mr. Green's Formulæ, applicable to the representation of M. Jamin's Experiments on Reflected Polarized Light.

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Dr. Petrie made the following observations upon two Irish inscriptions which appear, in tablets, on the sides of a stone which forms the upper portion of the shaft of the great stone-cross of Tuam, now exhibited in the Central Hall of the Great Industrial Exhibition; and of which, through the kindness of the Fine Arts Committee, he had got casts made, to be deposited in the Museum of the Academy. He remarked that he gladly availed himself of the opportunity now afforded him of making this communication, as he had, in his *Essay on Irish Ecclesiastical Architecture*, been the first to draw attention to this remarkable and truly magnificent remain of Irish art; and more particularly as—from a recent examination of that portion of the monument which bears these inscriptions, and which portion he had not himself previously seen—he was now enabled to give a more complete and accurate copy of one of the inscriptions than that which he had already published.

The first inscription is carved in two parallel vertical lines, to be read from the top downwards, and simply records the name of the Abbot of Tuam, successor of St. Jarlath, by or for whom the cross was erected. The inscription is as follows: